



Bar-Ilan University

**Mathematics for Economists B**  
**66-111-18-19**

**Lecturer: Dr Ziv Hellman**

**Type of course: Lecture**

**School year: 2016-2017**

**Term: Spring**

**Scope: 2.5 hours per week**

**Lecturer's contact details:** ziv.hellman@biu.ac.il

**A. Goals of the course / learning outcomes\*:**

Impartation of knowledge in mathematics, with emphasis on issues which are relevant for students of economics, in order to give them the mathematical tools that they may need for research and other endeavours in various economics-related professions.

We will use two textbooks in the course:

1. *Calculus*, by Howard Anton, Irl Bivens, and Stephen Davis
2. *Mathematics For Economists: An Introductory Textbook*, by Michael Pemberton and Nicholas Rau

The book by Anton, Bivens, and Davis is more important in this course and should be read at higher priority.

**B. Description of the course:**

**Outline of Lessons:**

1. L'Hopital's rule for calculating limits of functions using differentiation.  
Reading: Section 3.6 of Anton, Bivens, and Davis and Section 10.4 of Pemberton and Rau
2. General analysis of functions and curve sketching: increasing and decreasing functions, minima and maxima, convexity and concavity, inflexion points, asymptotes.  
Reading: Chapter 4 of Anton, Bivens, and Davis and Chapter 8 of Pemberton and Rau, and
3. The differential, approximation by differentials and Taylor series.

Reading: Sections 9.7 – 9.9 of Anton, Bivens, and Davis and Chapter 10 of Pemberton and Rau

4. The indefinite integral. Elementary indefinite integrals, methods of integration: change of variable and substitution, integration by parts, integration of rational functions.  
Reading: Chapter 5 of Anton, Bivens, and Davis and Chapters 19 and 20 of Pemberton and Rau
5. The definite integral and calculation of areas.  
Reading: Chapter 7 of Anton, Bivens, and Davis and Chapters 19 and 20 of Pemberton and Rau
6. Multi-variable functions: definitions, multi-variable differentiation of first and second order, multi-variable chain rule.  
Reading: Chapter 13 of Anton, Bivens, and Davis and Chapter 14 of Pemberton and Rau
7. Homogeneous functions.
8. Differentiation of implicit functions.  
Reading: Section 3.1 of Anton, Bivens, and Davis and Section 15.1 of Pemberton and Rau
9. Constrained minima and maxima, the method of Lagrange multipliers.  
Reading: Sections 13.8, 13.9 of Anton, Bivens, and Davis and Chapter 17 of Pemberton and Rau
10. Multiple Integrals  
Reading: Chapter 14 of Anton, Bivens, and Davis

**Prior requirements:**

Course 66-110, the first term of Mathematics for Economists

**Obligations / requirements / tasks\*\*:**

Attendance in the lessons, solving exercise sets during the course.

**Components of the final grade**

The grade on the final examination comprises 100% of the grade.

**Bibliography:**

Books:

3. *Mathematics For Economists: An Introductory Textbook*, by Michael Pemberton and Nicholas Rau
4. *Calculus*, by Howard Anton, Irl Bivens and Stephen Davis

\* Learning outcomes are explicit goals indicating what students are expected to achieve by the end of the study period in the course. Learning outcomes are defined in terms of attainment of knowledge, understanding, skills, abilities and/or attitudes that a student is expected to demonstrate as a result of his/her academic learning experience in the course. For additional details, [click here](#).

\*\* For further information, consult the university's official documents on avoiding ethical transgressions when submitting papers. To access this documentation, [click here](#).